



Honey Bee Network

Creative Eastern Himalayas



National Innovation Foundation

Trípurá

Manipur

Meghalaya

Mizorám

Nagaland

Arúnachal
Prádes

Assam

CREATIVE EASTERN HIMALAYAS



National Innovation Foundation

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HONEY BEE NETWORK

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PREFACE

National Innovation Foundation (NIF) has been pursuing the mission of making India innovative and a creative society since 2000 with the active support of Department of Science and Technology, Government of India. Till date NIF has been able to scout innovations and traditional knowledge practices from over 520 districts across India.

Thanks to the support of volunteers from Honey Bee Network, we have been able to discover many unsung heroes and heroines of our society who have solved local problems without any outside help.

Despite various constraints, NIF has put together a small book celebrating creativity, innovation and traditional knowledge from Eastern Himalayas. I am conscious of its limitation in terms of coverage and outreach. But if we could uncover at least a few examples of the ability of local communities and individuals to solve problems on their own without outside

help, how much more can be done if state and private sector agencies join hands with NIF actively.

I invite the state government and its various organs to actively support our quest to uncover many more creative communities and individuals in rural and urban areas. NIF will then help in building value chain around them.

The book is divided in three parts. The mechanical innovations developed by innovators from Eastern Himalayas are covered in part one. Selected examples of herbal traditional knowledge are given in part two. The innovations from other parts of the country suitable for the development of Eastern Himalayas are given in part three.

By no stretch of imagination, could we claim that we have achieved a great deal. We have merely made a simple point. There are a large number of knowledge rich people who

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may not have been educated much, may in fact be economically poor also, but still have the ability to solve a few problems so well.

The challenge really is to work out a synergy so that no creative voice remains unheard, and no solution remains localized and unrecognized. By adapting public policy in support of grassroots innovators and traditional knowledge holders, we can make economic development process more inclusive and sustainable.

This book on innovations has been compiled at the request of Dr. Vijay Kelkar, Chairman, Finance Commission and the Member, Governing Council of the National Innovation Foundation as a tribute to the creativity and innovation at grassroots. This presentation is part of a series of innovation compendium prepared for every State of India. We hope this will be followed up in the form of concrete policy and

institutional initiatives in each State to empower creative people to improve the quality of life of common people and thus promote inclusive growth.

It is my belief that such examples will act as spur for other State government departments to look for creative efforts of their staff and users at ground level. I hope that NIF will have the opportunity to work closely with the State government in future and expand knowledge base, add value to selected technologies and help them diffuse through commercial and non-commercial social channels for improving the livelihood of the majority of the people.



R. A. Mashelkar, FRS
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Building a Bridge with Grassroots Innovators in Informal Sector

To make the Indian development process more inclusive, there is no escape from building upon creative and innovative experiments pursued by common people at village or semi-urban level. Many of these experiments lead to development of innovations, which can improve productivity and generate employment. However, the purpose of a particular innovator may often be to solve just his/her problem. There is no mechanism available for him to share the knowledge, innovation or practice with other people in different regions. Sometimes, ideas and innovations get diffused through word of mouth. But many times, these ideas remain localized. In the process, potential growth and social development gets constrained. To overcome this constraint, Honey Bee Network with a handful of volunteers triggered a movement, twenty years ago to scout, spawn and sustain the unaided innovations and outstanding traditional knowledge from the informal sector of our country.

Drawing upon this experience, National Innovation Foundation (NIF) was set up in 2000 with the help of Department of Science

and Technology, Government of India to scale up the idea of learning from grassroots innovators.

Under the inspiring leadership of Dr. R. A. Mashelkar, Chairperson NIF and former Director General, Council of Scientific and Industrial Research (CSIR), NIF has taken major initiatives to serve the knowledge-rich, economically poor people of the country. It is committed to make India innovative by documenting, adding value, protecting the intellectual property rights of the contemporary unaided technological innovators, as well as of outstanding traditional knowledge holders. It aims at promoting lateral learning among local communities to generate low cost affordable solutions of the persistent and emerging problems, and enhance the diffusion of innovations on a commercial as well as non-commercial basis.

How does NIF work?

Primarily, NIF has five functions: (a) Scouting and documentation, (b) Value addition and research and

¹ The Honeybee collects pollen from the flowers but they are not impoverished, in the process links one flower to another enabling cross-pollination. Similarly, the Honey Bee Network strengthens people-to-people contacts, learning and networking by pooling the solutions developed by individuals across the world

in different sectors. The network acknowledges the innovators, traditional knowledge producers and communicators so that they do not remain anonymous.

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development, (c) Business development and Micro Venture, (d) Intellectual Property Rights protection and (e) Dissemination, database development and IT applications.

NIF has been entrusted with the responsibility of building a National Register of Grassroots Innovations and Traditional Knowledge. It is not enough to document or disseminate the innovations or outstanding traditional knowledge. Value addition is very important for harnessing the full potential of the idea. NIF has entered into MOU with CSIR and Indian Council of Medical Research (ICMR) besides other organizations. CSIR has allocated funds to support research on grassroots innovations in CSIR labs. Similarly, ICMR supports research on such herbal healing knowledge, which has not been documented in the classical texts and formal institutional literature. NIF also helps in generating a very large pool of open source / public domain technologies. A small number of innovations are also protected by patents and other IPRs.

The Honey Bee Network strongly believes in sharing knowledge among the providers of innovations in their own language, which is achieved by publishing local language versions of Honey Bee newsletter. It also ensures that a fair

For most innovators, attracting risk capital for converting innovations into enterprise is very difficult. They neither can offer much collateral nor are they able to develop a business plan or deal with formal R&D system.

A Micro Venture Innovation Fund (MVIF) has been set up with the help of SIDBI to provide risk capital for technologies at different stages of incubation. Under single signature, innovators are trusted and investments are made to help them commercialise their innovations. Most innovators do not make good entrepreneurs. For entrepreneurship, one has to make consistent batch by batch production of products. Innovators are often incorrigible improvisers. They seldom make two things alike. NIF has helped such innovators to license their technologies to third party entrepreneurs. Most of the licenses have been given to small entrepreneurs and in a few cases, to medium enterprises.

A very elaborate benefit sharing system has been developed, governed by the Prior Informed Consent (PIC) of the knowledge

share of benefits arising from commercial exploitation of local knowledge and innovations reaches the innovators and knowledge providers.

providers. Attempt is made to share benefits not only with the innovators but also with their communities and for nature conservation. In addition, a small part is kept for contingency support to needy innovators, for R&D stakeholders, promoting women's innovations and meeting overhead costs.

It is remarkable that grassroots innovations are generating global demand, as evident from inquiries from around fifty-five countries for various technologies, NIF has succeeded in commercializing products across countries in six continents apart from being successful in materialising thirty cases of technology licensing with the help of partner agencies.

What has it done?

With major contribution from the Honey Bee Network, NIF has been able to build up a database of more than 1,00,000 ideas, innovations and traditional knowledge practices (not all unique, not all distinctive) from over 520 districts of the country.

NIF has filed 182 patents in India and seven in US and one PCT application. Out of these, 33 patents have been granted to grassroots innovations in India and four in US. NIF has funded

113 projects under MVIF to the extent of Rs.1.3 crores. Hundreds of technologies have diffused through farmer to farmer social network.

NIF has proved that Indian innovators can match anyone in the world when it comes to solving problems creatively. Where they perform better than rest is in generating more affordable sustainable solutions by using local resources frugally.

Those who see poor only as the consumer of cheap goods, miss the knowledge richness at the grassroots level. The Poor can be the Providers also.

The Grassroots to Global (G2G) model that NIF is propagating is all set to change the way the world looks at the creativity and innovations at grassroots.

How can state government join hands with NIF?

- a. NIF has no field extension unit nor does it want to have one. However, state government has several field functionaries in the area of agriculture, education, industry, rural development, women and child care, forestry, etc. There can be a very fruitful partnership between NIF as a

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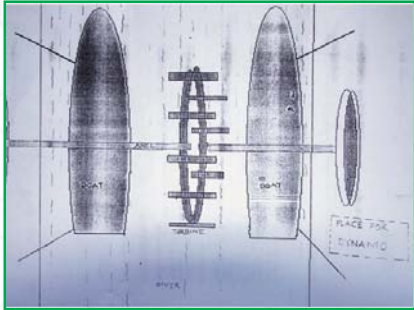
- source of innovative ideas and technologies and state government as partner in dissemination, value addition and even commercialization through incentives, promotion, subsidies, etc.
- b. State government can join the national campaign for scouting innovations and traditional knowledge and motivate its grassroots functionaries to join hands with NIF in uncovering the talent at the community level.
 - c. Students in schools and colleges can be motivated to scout creative and innovative people in their neighbourhoods and send the entries to NIF (Post Box No.15051, Ambavadi, Ahmedabad 380 015, campaign@nifindia.org). Examples of innovations can also be included in the curriculum for the school and college education.
 - d. Demonstrations and trials can be organized at various regional research stations and KVKs (Krishi Vigyan Kendras) so as to create awareness about the creative potential of common people.
 - e. The research institutions can be mandated to add value to the knowledge of innovative people and help in protecting their knowledge rights.

- f. On the state's website, link to NIF can be given and the innovations from the region can be displayed to put forward the creative face of the state before the people.
- g. Some of the innovative people identified by NIF and/or state government could be awarded at district and state level besides giving them support for further work.
- h. A nodal officer could be appointed to keep in dynamic touch with NIF to ensure that all the areas of possible cooperation are explored.

I hope that NIF would be able to develop a functional, fruitful and fulfilling relationship with the State Government. Tremendously rich knowledge of biodiversity and environment besides numerous grassroots innovations can be leveraged through the proposed collaboration.



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“Innovation opens up new vistas of knowledge and new dimensions to our imagination to make everyday life more meaningful and richer in depth and content”.

- Dr. A.P.J. Abdul Kalam



“The purpose of innovation is to create a new value for an individual, team, organization or for society at large”.

- Dr. R.A. Mashelkar

PART I

INNOVATIONS

from EASTERN HIMALAYAS

This section contains grassroots innovations emerging from the Eastern Himalayan Region

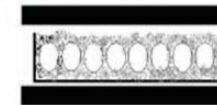
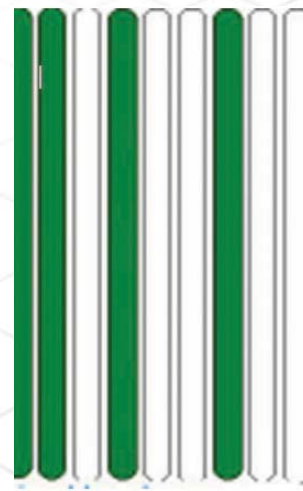


Imli Toshi Namo
Nagaland

Bamboo processing machinery, water pumps, electric hydro generators and others

Originally hailing from Mokokchung, Imli Toshi is a 27 year old serial innovator currently residing in Dimapur. After his BSc in Geology he has been self employed.

Toshi always had a keen interest in machineries and automobiles, which led him to develop many of his innovations. The idea of his first innovation came into his mind while he was washing his car. For this he needed to go to the waterfall just near his house for filling up his bucket with water every time. Then he thought of the possibility of diverting the water to his car-washing place. These thoughts resulted in the development of an innovative low discharge energy pump, which is a novel combination of a vane pump and spiral bladed water turbine. The innovation submerged in flowing water can lift water up to a height of one meter. For this innovation he was awarded in the 3rd National Competition of NIF in 2005.



He has also developed a Bamboo processing machinery/lathe for the removal of nodes and outer surface. One unit has even been purchased by the Nagaland Bamboo Mission. Using bamboo powder, which is a by product of this machine, he developed a composite material which he used in further developing a small electric hydro generator and a low cost bamboo wall. Among his other innovations some of the notable ones are bamboo strip making machine, weed uprooter for hilly region, egg-boiler and hot-water filter, incense stick making machine etc.

Toshi has been supported financially from NIF for development and dissemination of a few of his technologies.





Vekho Swuro*
Nagaland

*As per its mandate, NIF does not consider such professionals for awards or financial support, but only helps in providing visibility or linkages.

Naga smokeless dry oven

Vekho Swuro, belongs to Ruzazho Village in Phek District. He is currently employed as an Engineer under the State Government. In the year 1990 during one of his discussions with a doctor friend, Vekho Swuro heard that the conventional Naga method of drying meat and vegetables by exposure to smoke could cause cancer. This set Vekho Swuro to think seriously and after a number of trials spread over many years, he came up with his 'Naga Smokeless Dry Oven'. The oven can dry meat, fish, chilies, fruits, tea leaves as well as all kind of green vegetables, cardamom, turmeric, etc.

The oven is made of galvanized iron with bamboo racks. The lower compartment contains 1000 watts electrical heater or a uniquely designed fire box in the second variant. The temperature of the air in the upper compartment varies between 800° C – 900° C. In the upper compartment meat is hung from stainless rods / sharp bamboo. When the heat source is activated, it heats the center plate which in turn heats the air in the upper compartment. The hot air in the upper compartment dries the meat and vegetables uniformly.

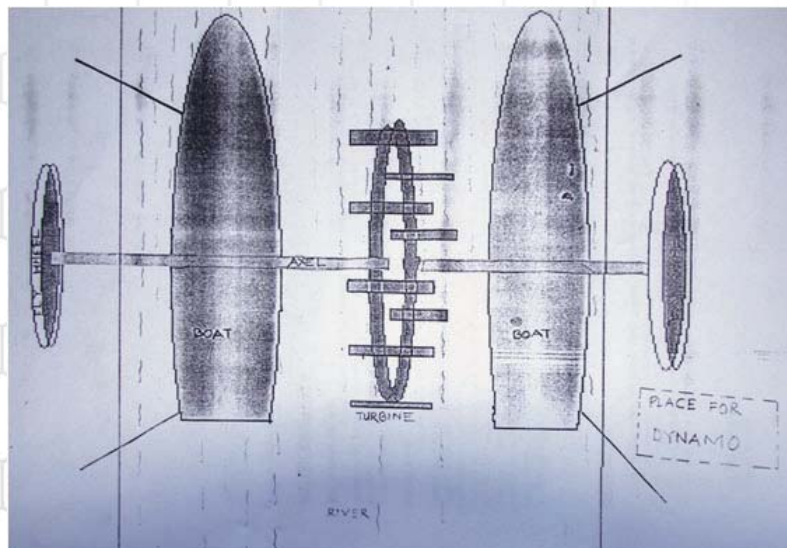
As a special consideration NIF assisted (through mainly, the linkages) the innovator in filing a patent for his innovation, which perhaps may be the first in Nagaland. It was also widely publicized in the local media with the help of NIF due to which the innovator has been able to sell more than 500 units till date, each costing between from Rs. 2000-3500 depending on the variants. For his contribution he was also awarded by the Governor during the Republic Day celebration in 2004.



Idea of a simple way to generate electricity from stream, cascades and sea waves

It is an idea of generating electricity in the hilly regions where streams, rivers, cascade run with a high velocity as in the remote areas of Tripura, or other parts of the country. Similarly, it may work with sea waves too.

Partha has proposed the use of Tow boats, turbine with axle, dynamo, and free wheel etc., for construction of an electricity generating device. For streams and cascades two boats are anchored in parallel with the banks of the river. A turbine with an axle is planted on the boats in such a way that the blades of the turbine touch the water surface as the picture describes. The axle ends are attached to the dynamos with belts. Electricity will be generated when the axle starts moving the turbine.



Partha Sarathi Deb
Tripura



Raju Thapa
Nagaland

Cost effective cool air fan

Raju Thapa, 30, self employed generator mechanic from the Lomithi colony in Dimapur is well known as an innovator in the locality.

Raju has come up with a cool air fan, which can be used as a substitute for air conditioners and water coolers. The novelty of the product is that there is no need to supply water regularly. It is also cost effective. The fan has two variants, one that produces water vapor and the other without this feature. The portable device can be run on AC current.

Woolen scarf knitting device

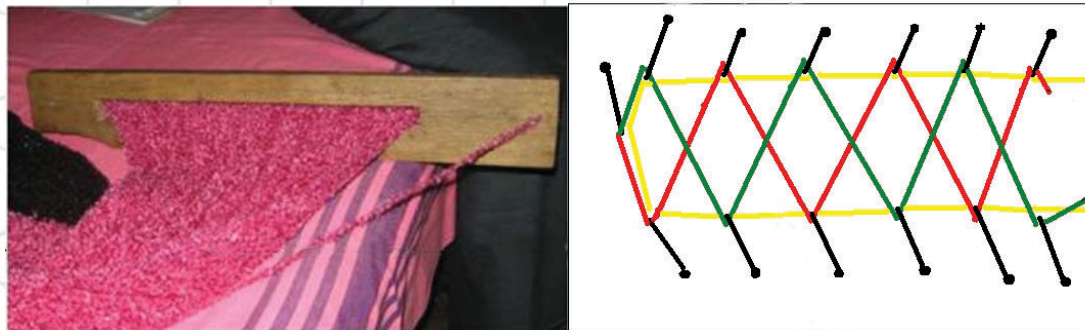
This is a very simple but useful innovation to knit woolen scarves. The device consists of a wooden rectangular base with nails fitted around an inner smaller rectangle. The space between the nails depends on the design of the pattern desired. The desired frill design is made by tying threads to the nails. Thereafter, based on the design, woolen thread is knitted over the nails. The threading of the woolen threads forms a net without any knots.

In each nail, there are two threads, one above the other. To make knitting continuous, the lower thread is picked, using a knitting hook, and put on top of the upper thread with a cross-over around each nail to ensure continuity of the knitted portion. The knitted part is pulled down from below, so that only one layer of knitted thread remains. Then the same process is followed until the desired length of the scarf is obtained.

This device makes knitting very easy for even the unskilled people and faster than traditional hand knitting. It can also make double layer pattern cloth or reversible design with no edge stitching.



**Moirangthem
Manglembi Devi**
Imphal





Yenkhom Mangi Singh
Thoubal

***Kouna* mat making machine**

Y. Mangi Singh, a 63 year old physically challenged person, has been able to provide the much needed impetus to the traditional *Kouna* (water reed) mat making industry in Manipur. *Kouna* is synonymous with the exotic craft tradition of Manipur; the unique feature is that Manipur is the only place where *Kouna* is grown and extensively used in local crafts. More than 4 lakh people in the unorganized sector are engaged in the state crafts industry and more than 180 items are made using *Kouna*.

This manual machine, which can even be operated by a low skilled worker or a physically challenged person can weave two mats per day. The quality of the mats produced is better than those produced by traditional methods.

The innovator has been financially supported for product development and market research. NIF has also engaged local designers, Nehru Yuva Kedra, Central Crafts office etc., for value addition and dissemination of this technology.

Portable cardamom drier –SAWO

Tavesu is a 55 year old farmer residing with his family in Sakraba village in Phek. He cultivates cardamom and other lesser value crops. He felt the need to improve the quality of drying vegetables and particularly cardamom in order to have value in the market. Working over a period of time he finally was able to build a drying device, which can utilize both charcoal and electricity as heat source. Tavesu named his innovations after the traditional drying system in a Naga kitchen- “SAWO”.

The SAWO is made of wood and aluminum sheet only. Steel frames and sheets are not used to avoid rusting. The normal single door variant of SAWO weighs 100 kgs while that of a double door weighs 200 kgs. Both of these variants consist of two racks inside. In the first model 25 kgs of cardamom can be dried in 4 hrs at a time while in the second model 50 kgs can be dried in the same time period. The SAWO dried cardamom fetches a much higher price for farmers than the Government Approved drying machines with a margin of Rs. 10- 25 per kg. The SAWO can also be used as a freezer with the help of an exhaust fan.

At present the innovator owns a small SAWO manufacturing unit in his village. Through this he has sold around 75 units out of which 54 units were purchased by the Government. Tevesu’s objective is to help and encourage young people to take up self employment in Agriculture by creating higher value for agricultural products by appropriate and low cost technological interventions.

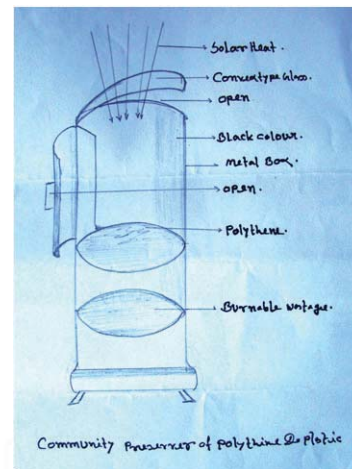
Tavesu Vadeo
Nagaland

Tutan Das
Tripura

Incinerating polythene carry bags by sun light

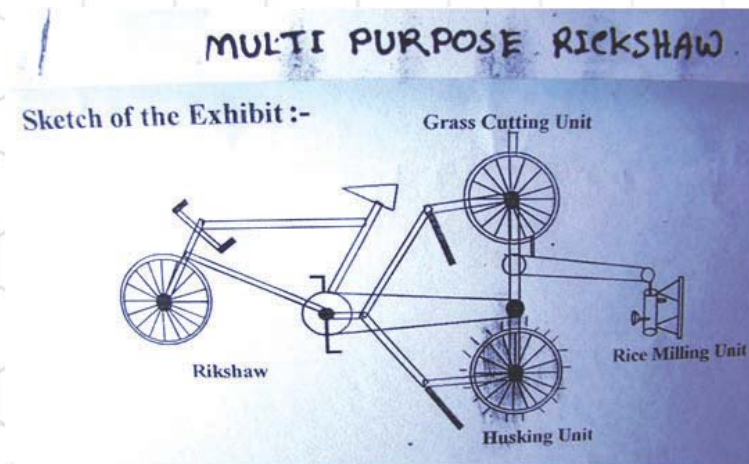
The innovator has proposed a metal box with a black colored outer wall having one concave roof. The roof should have two parts, which can be opened like doors. There will be another box in the shape of a cone or square below the first box with an opened upper surface.

Polythene bags or plastic garbages are kept on the upper box and combustible wastage are kept on the lower box. After this the box is placed in sun light with the concave cover facing it. Due to the black color of the surface the box will be heated and the garbage will be burned. Thus the polythene may be condensed and change into smaller manageable sizes.



Multi purpose rickshaw

In this partially modified “Cycle Rickshaw”, the body and rear wheels (two) are removed after which specially designed wheels are attached to the rear axle. One of these wheels functions as a paddy and wheat husker and the other wheel functions as a grass/hays cutter. This is especially used for preparation of cattle feed. The attachment may additionally be used for cutting bamboo mats and jute bags, etc. This may be quite useful for development of cottage industries.



09



Gobinda Deb Nath*
Tripura

*As per its mandate, NIF does not consider such professionals for awards or financial support, but only helps in providing visibility or linkages.

Mathura Phonglo
Nagaland

Herbal treatment for bone fracture

This particular treatment was passed on to Mathura by his late father Thangbandao Phonglo. His father had invented this treatment by careful experimentation and a rigorous trial and error process over a period of time. After successful trials on animals his father started giving the treatment to members of his Dimasa tribe. Before his death Thangbandao passed on the knowledge of the treatment to Mathura who had retired from the Eastern Frontier Rifle Battalion.

The treatment consists of a paste, which is procured by grinding together parts of four plants (local names: Methafly, Samnathu, Kathisoanithongaphom and Phislem). This is then put along with a bandage or leaves over the damaged bone. Splints fashioned out of bamboo are also used so that the broken bone is held in place. In a few days time even badly damaged bones are reported to heal. Mathura's treatment has gained reputation in the local region such that even out of state patients flock to him for cases where conventional medical treatments have even failed. For them Mathura's small house is always available for the duration of their treatment for free with only a condition that they have to take care of their cooking separately. Mathura has treated over a thousand patients, which is evident from the patient register that he started maintaining only a few years back. As Mathura dispenses his treatment for free, he maintains his family with a small amount that he gets as donations from grateful patients.

Mathura's only wish is that he be given a plot of land so that he can cultivate the four plants, which otherwise have to be collected from the forest day after day. A grinder to make the paste and a refrigerator to store the paste would also be very helpful. NIF has not been able to give full support to the innovator as two of the constituent plants have not been taxonomically identified yet. Matter is being pursued with experts.

Method of repelling pests

During the month of September- October, there is heavy damage of paddy due to the attack of pests like *Tryporyza incertulas*. To get rid of this pest Jadav has tried mixed cropping of paddy with arum. In this practice arum is cultivated after every two lines of paddy. This reportedly keeps the insect out of the paddy field.

Jadav Mazumdar*
Tripura

*As per its mandate, NIF does not consider such professionals for awards or financial support, but only helps in providing visibility or linkages.



Ghonakanta Gogoi
Assam

Multi purpose wood-working machine

Small carpentry workshops have difficulty in purchasing and using multiple machines due to high initial costs, space constraints and maintenance considerations.

This multipurpose machine with minimal footprint, is built to address all major workshop needs, allowing completing the sequence of wood-working operations in one place, and allowing better control on finished product.





Karuna K. Nath
Assam

Manual wood cutting & Bamboo cross cutter

Cutting of wood effectively and efficiently is achieved by this machine. The equipment is cost efficient, and can be manually operated with both hand and foot pedal options. Most importantly it is portable, and can be taken to any worksite and has more productivity compared to manual sawing.

This equipment consumes lesser time and labour compared to available saws and has a mechanism and linkages similar to manually operated sewing machine. The work of three labourers can be done by one labour using this machine. The innovator has been supported under the Micro Venture Innovation Fund scheme of NIF and has been doing modest business in the area.



Bamboo splitting machine

The innovator is an energetic motor vehicle mechanic who came up with his innovation for splitting and dressing bamboo to meet a local need. With this machine one can split bamboo lengthwise and also into small pieces. This machine has an additional feature to maneuver and shave them into finer strips as well. This machine can be a useful substitute of *dao* and other such tools used by people for splitting and dressing bamboo. It is easy to operate, efficient and economical in nature as its output is almost three times in comparison to manual labour.

Liagi Baht
Arunachal Pradesh





NATIONAL INNOVATION FOUNDATION, INDIA

The Sixth National Biennial Competition for Green Grassroots Unaided Technological Innovations and Traditional Knowledge

Co-sponsors



Honey Bee Network



CSIR



SRISTI



IIM-A

The competition

The NIF, set up by Department of Science and Technology, GOI, seeks entries of unaided technological innovations and traditional knowledge developed by an individual or group comprising farmers, artisans, fishermen and women, slum dwellers, workshop mechanics, students, local communities etc., in managing natural and/or other resources. The innovations can be in machines, gadgets, implements, or processes for farm operations, household utility, transportation, energy conservation or generation, reduction in drudgery, creative use of biodiversity, development of plant varieties, generation of herbal remedies for human or animal health or developing new or any other low cost sustainable green technology related to various aspects of survival in urban and rural areas. Creative ideas for innovative technologies which have not yet been reduced to practice are also welcome. Communities developing People's Biodiversity Register (PBR) or People's Knowledge Register (PKR) are encouraged to register/link their knowledge base with the National Register at the NIF.

The awards

The best three innovations and traditional knowledge practices will be awarded Rs 1,00,000, Rs 50,000 and Rs 25,000 each in different categories. In addition, individuals and/or organizations that make extraordinary contributions in scouting grassroots innovations and traditional knowledge may also get awards worth Rs 50,000, 25,000 and 15,000 respectively besides recognition to many others. There will be several consolation prizes of Rs 10,000 each in different categories depending upon the number of entries and incremental inventiveness and potential social and environmental impact. Three most outstanding innovative ideas may be given prizes of Rs 50,000, 25,000 and 15,000 in addition to consolation prizes of Rs 5,000 each. There are special prizes for innovations by or dealing with, physically challenged people. The innovations /ideas of professionally trained

persons are not considered for award or financial support. There are special awards for journalists writing about grassroots innovations and/or traditional knowledge and creating greater awareness about NIF's missions. *The award money may be revised in due course.*

Students

Young inventors and innovators are invited to send their ideas or innovations for a special category of awards for them. These should be unsupervised, an outcome of their own creativity, without any support from their teachers or outsiders. There will be prizes worth Rs 15,000, 10,000 and Rs 7,500 for the best three entries and several consolation prizes of Rs 5,000 each in this category.

How to participate

Individuals or groups may send as many entries as they wish on plain paper providing a) genesis of the innovation and traditional knowledge b) its background and c) educational qualification and occupation, accompanied by photographs and/or videos if possible and any other information that may help in replicating the innovations/traditional knowledge. Herbal entries may be accompanied by dried plant samples to enable proper identification procedure. The **Sixth National Competition started on February 1, 2007 and entries would be accepted till January 31, 2009.** Every entry should include the **full postal address** to facilitate further communications.

Where to send entries?

National Coordinator (Scouting & Documentation), National Innovation Foundation, Bungalow No. 1 Satellite Complex, Premchand Nagar Road, Ahmedabad 380015 Gujarat
Toll Free No 1800 233 5555 Fax: (079) - 2673 1903
email: campaign@nifindia.org; www.nifindia.org